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Effects of an instructional intervention on student nurses' awareness of hearing impaired patients' communication needs

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INTRODUCTION

Due to the aging of the "baby boom" population and to several contributing factors such as the prevalence of genetic and environmentally acquired hearing losses, noise exposure, and the use of ototoxic prescription medications, hearing loss has become one of the more prevalent health concerns in the United States (Agrawal, 2008). It is estimated that about ten percent of the population suffers from at least a mild hearing impairment (HealthyHearing.com, 2013) with only about forty percent of individuals with moderate to severe hearing impairment electing to use some form of amplification or assistive listening device (Kochkin, 2009).

The dilemma facing health care professionals, such as nurses, is that a hearing impairment is invisible, especially for those patients choosing not to wear a device that could potentially cue the nurse that a communication problem exists. Adding to this invisibility is the development of amplification devices that, at the request of the consumer, are designed to be less visible. Also, due to growing improvements in technology and medical healthcare, profoundly hearing-impaired patients who, prior to these developments in technology, could not benefit from amplification, may be surgically fit with cochlear implants and enabled to communicate both aurally and orally (Svirsky, Robbins, Kirk, Pisoni, and Miyamoto, 2000). These developments have significantly increased the population of individuals who wear prosthetic amplification or stimulation devices. Thus, a health care provider must be diligent in identifying patients with hearing loss or who wear an amplification device such as a hearing aid or cochlear implant. Once identified, the health care provider should be knowledgeable about the basic care and proper use of amplification/stimulation devices as well as strategies for confirming accurate reception of messages by the patient. Knowingly providing all aspects of nursing care to this

patient population without this knowledge base could certainly pose an ethical concern. This is especially true for patients in an intermediate or long-term care facility where more opportunities for hearing aid failure and cochlear implant malfunction exist and where it is essential that verbal communications from health care providers are accurately received. Of course, confirmation of communication is equally important during initial interviews with patients, in counseling patients regarding proper medication dosages, and when presenting pre and post-operative instruction.

Most permanently hearing-impaired patients have a type of disorder that is medically not correctible by surgery or medications. For patients with this non-correctible hearing loss, the preferred approach to improve hearing is through the use of hearing aids, cochlear implants, or assistive listening devices. The most recently developed approach is the cochlear implant, which is now an option for profoundly hearing-impaired individuals whose loss is so severe that amplification is of little or no benefit. For these individuals, a surgically implanted device has made it possible to acquire hearing and to develop the use of spoken language. These devices may be implanted in individuals ranging in age from newborn to elderly (Peterson, Pisoni, and Miyamoto, 2010).

The vast majority of amplification and implanted devices are battery powered and susceptible to failure due to loss of power, mechanical blockage of sound pathways, and mechanical malfunction. Also, a new hearing aid user, especially if elderly, is likely to have difficulty placing the instrument in their ear properly. Training in battery replacement, hearing aid/cochlear implant troubleshooting, and proper placement in the ear, or on the implant site, is provided to all individuals who wear such devices. However, the quality and quantity of training provided to consumers varies greatly. It is common for an amplification device user to need assistance to

assure proper usage long after the initial fitting. Therefore, when a hearing-impaired individual becomes a healthcare patient, it is essential that the healthcare provider is knowledgeable of the communication needs of the hearing impaired patient and their devices to ensure compliance with ethical guidelines regarding provision of care to these patients.

An informal review of several randomly selected nursing school's curricula revealed that the communication needs of hearing impaired patients and their amplification devices were not directly addressed, although the need for awareness of communication with the hearing impaired patient was recently reported (McConnell, 2008). Additionally, continuing education courses specifically for nurse's that addressed this topic were not readily available. Therefore, the authors developed specific instructional materials to supplement a School of Nursing curriculum in the area of hearing impaired patients' communication needs.

METHOD

The purpose of this project was to assess the effectiveness of the instructional materials that were developed to supplement a School of Nursing curriculum. To accomplish this assessment, the authors provided an instructional intervention to a class of 41 School of Nursing students at the University of Southern Mississippi. The same survey questions used in Kemker, et al, were used to assess the acquisition of knowledge and new skills by the participants in this project.

SUBJECTS

Forty-one undergraduate students enrolled in a research class in the University of Southern Mississippi School of Nursing served as subjects. Participation in the study was voluntary and there were no academic or monetary incentives to participate.

QUESTIONNAIRE

The questionnaire consisted of eight content areas (Appendix). The content areas addressed participants' knowledge of, or possession of, specific skills in assisting a hearing impaired patient or in communicating with a hearing-impaired patient.

INTERVENTION MATERIAL

Intervention materials were developed by the authors with the intent to address specific knowledge and skills that were previously identified in a survey of practicing nurses. A PowerPoint lecture, a laminated 8" by 12" troubleshooting guide for hearing aids and cochlear implants, and three instructional videos were produced that specifically provided informational content on, and/or demonstrated the skills needed by a nurse to assist a hearing-impaired patient who wears a hearing aid, assistive listening device, or cochlear implant. The videos were made by a professional videographer at USM. A local professional television announcer provided the scripted voice over. The script was developed by two of the authors (Marx and Ward).

INTERVENTION

Participants first completed the pretest questionnaire. The intervention was immediately provided by two of the authors (Ward and Marx) following the pretest survey. The intervention consisted of a fifty-slide PowerPoint lecture, a cochlear implant video lasting six minutes, a hearing aid video lasting four minutes, and a return demonstration of specific hands-on skills in small groups of 5-6 participants. The total duration of the intervention was approximately one hour. The posttest questionnaire was conducted immediately after the intervention.

The three videos depicted proper placement of a hearing aid or cochlear implant, the various parts of each, when and how to assemble or disassemble each item, and a segment on communication strategies to enhance effective communication between nurses and their hearing- impaired patients. In addition, a hearing aid trouble-shooting guide was developed by the authors. The guide contained basic instructions and photographs of instruments, battery types, cleaning tools and battery testers. This guide was produced in a laminated version by the Image/Copy Center at the University of Southern Mississippi and subsequently provided to each participant in this project.

The lecture portion of the intervention included such topics as the historical perspective leading to the development of this project, demographic data and incidence of hearing loss in the general US population, basic information related to type, degree and common etiologies of hearing loss, methods of assessing hearing loss, types of assistive devices and hearing aids and how they function, trouble-shooting tips for hearing aids and cochlear implants, and effective communication strategies for nurses when dealing with a patient that does not have normal hearing. In addition, during the lecture, students were provided an opportunity to participate in hands-on, return demonstration training involving the proper placement of and simple trouble-shooting of difficulties with hearing aids and cochlear implants.

RESULTS

The pretest and posttest responses to the survey questions for each participant were compiled in an Excel data file. Responses to questions were either “yes” or “no” that a participant possessed that knowledge or skill. For each question, a “yes” response corresponded to a participant’s designation that he/she has knowledge of the content area or possesses the designated skill.

Descriptive statistics showing the percent change in “yes” responses were gathered and are shown in Figure 1. Because the authors were interested in knowing whether or not the intervention was statistically successful, the McNemar test for significant change was used to evaluate the data. The results of the McNemar tests are shown in Table 1. The McNemar findings show that there was a significant increase in participants’ “yes” responses to each of the eight content areas addressed in the questionnaire.

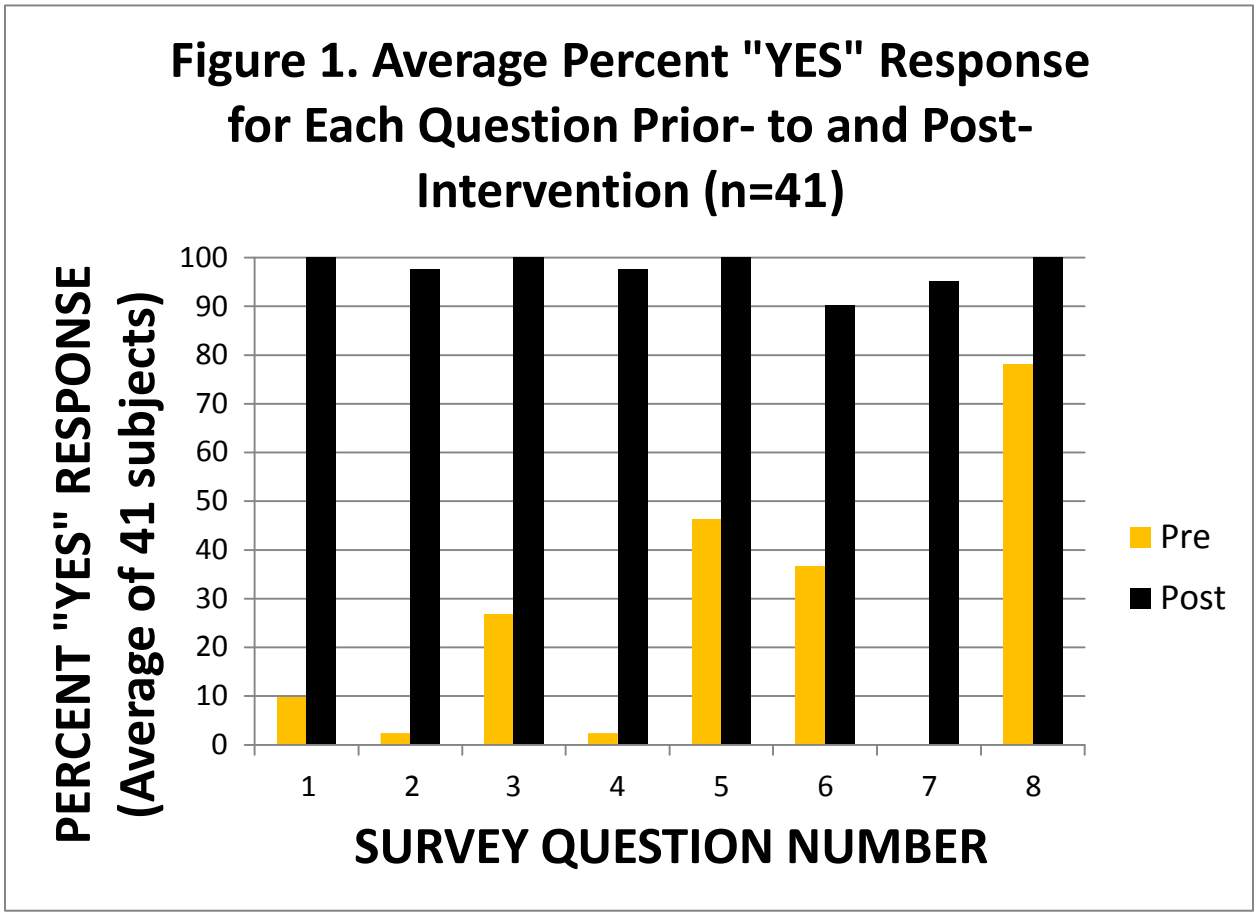

Table 1. Summary of McNemar Statistic for "YES" Responses to each question. The Critical Values for Chi Square are 3.84 (df = 1, p = .05) and 10.84 (df = 1, p = .001).

CONTENT OF SURVEY QUESTION	"YES" RESPONSES ON PRE-TEST	"YES" RESPONSES ON POST-TEST	CHI-SQUARE	P-VALUE
How to replace a battery in hearing aid	4	41	37	<.001
How to replace a battery in a cochlear implant	1	40	39	<.001
How to place hearing aid in patient's ear	11	41	30	<.001
How to trouble-shoot a defective hearing aid	1	40	39	<.001
How to verify patient understood message	19	41	22	<.001
Identify need for an assistive listening device	15	37	22	<.001
How to trouble-shoot "whistling" hearing aid	0	39	39	<.001
How to speak at appropriate level	32	41	9	<.005

DISCUSSION

A previous study (Kemker, et al, 2013) identified a need for supplementing the curriculum for students at Schools of Nursing. The educational area to be supplemented is related to awareness of the communication needs of hearing impaired patients. Due to a recently reported increased prevalence of hearing impaired individuals in the general population (HealthyHearing.com, 2013), this educational need is deemed by the authors to be of substantial importance. Furthermore, nurses that continue to provide health care services to hearing-impaired patients without rudimentary training in this area or that are not aware of the communicative needs of this patient population would pose an ethical concern.

This project investigated the effects of an instructional intervention on a class of 41 students in a research class in the School of Nursing at the University of Southern Mississippi. The instructional materials were developed by the authors with the assistance of the Videography

Department at USM. The results showed a statistically significant improvement in student nurses' knowledge of specific skills and awareness of strategies to improve communication with a hearing impaired patient who wears a hearing aid, a cochlear implant, or who is hearing impaired but wears no device. A McNemar test for change yielded significant p values for each of the eight content areas.

These findings suggest that the educational materials developed for this project are an effective supplement to a School of Nursing curriculum. However, it does not rule out that other educational materials developed by other educators may be equally effective. The instructional materials (PowerPoint file, three videos, and a laminated trouble-shooting guide) are available to any institution of higher learning.

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